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Rear Adm. Pachuta Recognizes NMRC Ebola Team

Story by Mikelle D. Smith, Naval Medical Research Center Public Affairs



Rear Adm. Stephen M. Pachuta (left) speaks during an Admiral's Call at Naval Medical Research Center (NMRC) in the Albert R. Behnke Auditorium, Feb. 20. During the Admiral's Call, Pachuta recognized and awarded four NMRC Sailors for their involvement in the West African Ebola epidemic in Liberia, as part of two NMRC mobile laboratory teams. (Photo taken by Mikelle D. Smith, Naval Medical Research Center Public Affairs)

SILVER SPRING, Md., -- Naval Medical Research Center (NMRC) Commanding Officer, Capt. John W. Sanders welcomed Director, Medical Resources and Policy Division Rear Adm. Stephen M. Pachuta, for an awards ceremony and tour of the command directorates, Feb. 20.

Pachuta and his accompanying staff members were greeted by Sanders and NMRC Senior Enlisted Leader HMC Jerrold Diederich upon arriving to the facility.

An Admiral's Call was held in the Albert R. Behnke Auditorium where Pachuta had the opportunity to recognize NMRC staff members

involved in the efforts to combat the West African Ebola epidemic in Liberia.

Pachuta expressed his gratitude to the NMRC staff for continuing to be at the forefront of Navy Medicine and gave awards to three returning researchers and one Navy Hospital Corpsman; Lt. Cmdr. Michael Gregory, Lt. James Regeimbal, Lt. Jose Garcia and HM1 Yusupha Kah.

Additionally a tour, led by NMRC directorate and department heads, was given to Pachuta during his visit. On the tour Pachuta had the opportunity to meet with NMRC's

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NMRC Commanding Officer's Message



The Naval Medical Research Center provides answers and development solutions for health and medical issues for the men and women of the Navy and Marine Corps in all operational settings. NMRC conducts a global research and development program that is currently executed through seven subordinate research commands, numerous joint service initiatives, and a well-established cooperative infrastructure working with universities, industry and other government agencies. Our researchers work on projects in areas such as military operational and expeditionary medicine, combat casualty care, vaccine development, fatigue intervention, resiliency building and spatial disorientation. We are making advances in wound management, regenerative medicine, traumatic brain injury, infectious disease diagnostics, bone marrow transplantation, and so much more.

Here are a few examples. The Naval Submarine Medicine Research Laboratory is studying enclosed atmospheres, submarine escape procedures, decompression sickness and hearing preservation. The Naval Health Research Center is focused on warfighter performance, medical modeling and wounded warrior care. The Naval Medical Research Unit – Dayton is exploring performance and survivability through aeromedical and environmental health research that includes looking into pharmaceuticals for motion sickness and fatigue countermeasures. The Naval Medical Research Unit – San Antonio is collaborating with neurosurgeons, and oral and maxillofacial surgeons to reduce postsurgical infections related to cranial implants to replace lost bone tissue. The Naval Medical Research Center works on finding solutions to operational medical threats such as decompression illness, traumatic brain injury, and infectious diseases. We have three OCONUS infectious disease research commands. They are in Cairo with a field site in Accra, Ghana; Singapore with a field site in Phnom Penh, Cambodia; and Lima, Peru, with a field site in Iquitos, Peru. Their mission is to detect infectious threats of military or public health importance and to develop and test mitigation strategies against those threats. The location of these labs and their principal field sites on three continents and in climatic conditions ranging from tropical rain forest, to coastal areas and inland deserts are ideally suited to the study of the widest range of potential infectious disease threats to operational forces.

NMRC Commanding Officer sends,
John. W. Sanders III, CAPT, MC, USN

NAMRU-3 Commanding Officer's Message

An outbreak of avian influenza (A/H5N1) in Egypt that began in November of last year has now involved more human cases than the total recorded in any year since the virus first appeared in this country in 2006. NAMRU-3 has been in the forefront of assistance to the Egyptian government's outbreak response, by sequencing viral genes – and one entire genome – directly from clinical and poultry samples to monitor for emergence of new mutations or antiviral resistance markers. To date, the virus appears essentially unchanged from prior years and the rise in human cases is attributed to greater circulation among poultry, especially backyard and unregulated flocks. NAMRU-3 has also facilitated the reach-back assistance of the Influenza Division at CDC for confirmatory testing and additional analysis, and has coordinated with the WHO on a combined animal/human health consultation mission to Egypt, including experts from the World Organization of Animal Health and the Food and Agriculture Organization of the UN.

NAMRU-3's timeliness and relevancy in helping addressing this H5N1 outbreak reflects solid scientific capability, and also illustrates the network of productive working relationships that NAMRU-3 scientists sustain and nurture in the course of work in Egypt and the region. As a trusted local partner with a proven record of scientific achievement, NAMRU-3 is uniquely placed to engage pro-actively in emerging global health challenges like this. As we do so, we offer distinct diplomatic value as an expression of U.S. humanitarian and scientific leadership, while also advancing health security and scientific progress.

The biannual Navy Medical Research and Development Enterprise meeting in San Antonio in early March provided a great opportunity to re-affirm this dual value of NAMRU-3 and her sister labs, NAMRU-6 and NAMRU-2. As we continue to work across the organization to optimize scientific priorities, funding plans, and manpower allocation, challenges like H5N1 remind us that excellence in our Navy mission execution overseas projects the best of the United States abroad.



NAMRU-3 Commanding Officer sends,
John Gilstad, CAPT, MSC, USN

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Infectious Diseases Directorate (IDD) Head Dr. Kevin Porter; Operational and Undersea Medicine Directorate (OUMD) Head Dr. Stephen Ahlers; OUMD Undersea Medicine Department Head Capt. David Regis; and, OUMD NeuroTrauma Department Head Dr. Richard McCarron.

During the tour Pachuta viewed the setup of an NMRC mobile laboratory. Back in October 2014, NMRC staff members deployed to Liberia assisting in the global effort to combat the West African Ebola epidemic.

Pachuta was shown each aspect of the mobile lab and given a brief synopsis of the work the teams were performing in Liberia.

Porter escorted Pachuta into the insectary, which is shared by Navy and Army.

He received an overview of NMRC efforts in battling infections such as Malaria and Dengue Fever. There were also in-depth discussions on the research efforts of combating traveler's diarrhea and scrub typhus, wound infections and enterics.

The tour concluded with a visit to the facilities, hyperbaric flight chambers and blast tube area. In the blast tube area, Pachuta was able to witness a demonstration of the device, which is used to understand the effects explosions may cause to service members, such as traumatic brain injuries.

Naval Medical Research Center is

headquarters to the Naval Medical Research and Development enterprise. Its mission is to conduct health and medical research, development,

testing, evaluation, and surveillance to enhance deployment readiness of DoD personnel worldwide.



Rear Adm. Stephen M. Pachuta (right) visited the insectary at Naval Medical Research Center (NMRC), as part of a facilities tour, Feb. 20. Pachuta was escorted by Infectious Diseases Directorate Head Dr. Kevin Porter, along with other NMRC leadership and researchers. Pachuta received an overview of NMRC efforts in battling infections such as Malaria and Dengue Fever. (Photo taken by Mikelle D. Smith, Naval Medical Research Center Public Affairs)

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Graphic illustration by Mikelle D. Smith, Naval Medical Research Center Public Affairs

Navy Surgeon General Fosters Medical Collaboration, Global Health in Egypt

Story by Capt. Dora Lockwood, U.S. Navy Bureau of Medicine and Surgery Public Affairs



Vice Adm. Matthew L. Nathan, Navy surgeon general and chief of the U.S. Navy Bureau of Medicine and Surgery, observes a basic life support class at the Galaa Military Medical Compound in Cairo, Egypt. Nathan visited Cairo to discuss advances in military medicine and the strategic value of military medical partnerships. (U.S. Navy photo by Capt. Dora Lockwood/Released)

CAIRO (NNS), -- The Navy's Surgeon General visited Egyptian military medical facilities in Cairo, Feb. 15-17.

Vice Adm. Matthew L. Nathan, Navy surgeon general and chief, U.S. Navy Bureau of Medicine and Surgery, visited Galaa Military Medical Compound (GMCC) and the Armed Forces College of Medicine.

While at GMCC, Nathan met with the commander of the hospital, Maj. Gen. (Dr.) Bahaa El-Din Ziedan and toured the pediatric, trauma, neurosurgery, intensive care unit and cardiac departments of the facility. Capt. John Gilstad, commanding officer of U.S. Naval Medical Research Unit No. 3 (NAMRU-3), and Capt. Patrick Blair, executive officer of NAMRU-3, also participated in the visit.

"It is my honor to meet you today and visit the Galaa military hospital and develop stronger ties between Navy Medicine and Egyptian medicine," said Nathan. "Our jobs are important to each of our nations. We have similar jobs of taking care of the health of our Sailors and Soldiers."

During the visit, the leaders discussed recent advances in military medicine and potential health partnerships.

"It is our great pleasure to welcome you in our medical compound," said El-Din Ziedan. "Your visit, in fact, is extremely valuable and worthy to us. My hope is to continue our exchange of experiences."

Nathan reiterated the importance of learning from one another and sharing

unique experiences.

"I am very interested in learning about new illnesses and disease," said Nathan. "I welcome the opportunity to look for more exchanges between our scientists and physicians and your Egyptian counterparts."

Following the tour of GMCC, Nathan visited the Armed Forces College of Medicine. There, he met Maj. Gen. (Dr.) Khaled Eissa Amer, Dean of the college, and Col. Mohammed Sallah, chief of staff. Nathan expressed his appreciation to the dean and his college staff for their hospitality.

"As the head of the U.S. Navy's medical department, one of the reasons for my trip is to create more understanding

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Navy Medicine R&D Commanding Officers Meet in San Antonio

Story by Flisa Stevenson, Naval Medical Research Unit-San Antonio Public Affairs

The Naval Medical Research Unit, San Antonio (NAMRU-SA) hosted the annual Navy Medicine Research and Development (R&D) Enterprise Leadership Meeting, March 3 – 5.

Navy Medicine's diverse R&D capabilities and broad scope of research was when laboratory leadership, science directors, and financial managers from all eight CONUS and OCONUS laboratories came together in South Texas to share research developments, accomplishments, discuss issues of concern, and look ahead to the future.

NAMRU-SA Commanding Officer Capt. Rita Simmons said, "One Team, One Fight," was the overarching theme for this meeting with topics focusing on the pursuit of joint programs and collaboration, eliminating potential duplication of efforts, and identifying strategies to strengthen the way we do business. Science discussions aimed at improving on the health and readiness of warfighters and their future capabilities include, infectious emerging diseases, antimicrobial resistance, fatigue, and combat casualty care.

The Naval Medical Research Center's (NMRC) Commanding Officer, Capt. John W. Sanders III, launched the meeting by announcing the slate of new Commanding Officers and Executive Officers. Change is a constant in the R&D enterprise and even in this season of turnovers-- leaders are challenged to focus on progress, identify barriers, and advance toward anticipated outcomes within funding and budget limitations.

"Doing more with less requires collaboration," said Sanders.

The annual meeting supports cross-lab collaborations by facilitating joint program efforts, enhancing problem solving, fueling innovation, and building camaraderie between new and established leaders. Working groups and breakout sessions tackled challenging administrative issues and questions emerging from the research.



The Naval Medical Research Center's Commanding Officer, Capt. John W. Sanders III addressed Navy Medicine R&D Commanding Officers at a meeting hosted at Naval Medical Research Unit-San Antonio. (Photo courtesy of NAMRU-San Antonio Public Affairs)

In between working group reports and breakout sessions, the commanders had a guided tour of the NAMRU-SA research facilities.

The Commanders had the opportunity to see NAMRU-SA's electrospinning device in action. The NAMRU-SA research team adapted the device to weave chemicals and proteins into "super bandages" that can aid in the quick healing of a wound. NAMRU-SA researchers also demonstrated the Optical Coherence Tomography system (laser device), that allows one to see subtle discrepancies and cracks in a tooth that can't one cannot be seen by during a regular dental exam.

During the tour, the Commanders learned more about NAMRU-SA's collaboration with neurosurgeons, and oral and maxillofacial surgeons to reduce postsurgical infections related to cranial implants.

Others projects on the tour included the laser-induced photo-acoustic method to destroy bacteria, a portable and rechargeable field-ready ozone sterilizer, and NAMRU-SA's shock and resuscitation research that is advancing the

understanding of the molecular aspects of the immune response to shock and the long-term effects of shock in warfighters.

NAMRU-SA's group of Postdoctoral Fellows led several of the tour presentations demonstrating the valuable contribution of diverse staffing in bioengineering, cell biology, chemical engineering, immunology, microbiology, and physiology, plays in our approach to problem solving.

Simmons said, "The meeting was acknowledged as a resounding success, and an important part of our enterprise strategic development." The next Commanders' meeting will be announced at a future date.

The Public Affairs Office is also an inherent part of the R&D enterprise and recently launched a new video series to communicate Navy Medicine's accomplishments and stories in an engaging manner to a digitally connected public. The Commanders had a chance to view the new Navy Medicine YouTube video titled "Scrubbing In" focusing on vaccine research at NMRC.

NMRC Researchers Conduct Phase 1 Malaria Clinical Trials

Story by Mikelle D. Smith, Naval Medical Research Center Public Affairs

SILVER SPRING, Md., -- Researchers in Naval Medical Research Center's (NMRC) Malaria Department are conducting a clinical trial in support of malaria vaccine development.

The clinical trial titled "*Phase 1 Trial with Challenge to Assess the Safety and Biomarkers of Protection in Malaria-naïve Adults of Immunization via Mosquito Bite with Radiation-Attenuated Plasmodium Falciparum Sporozoites*," also known as the IMRAS study, began in early 2014. Enrollment for Cohort I has been completed, and recruitment for Cohort II is ongoing.

"This study is a comprehensive, systems biology-based effort to identify and validate biomarkers of protection associated with *Plasmodium falciparum* radiation attenuated sporozoites (PfRAS) immunization, comparing sterile protected to non-protected study subjects," said Lt. Cmdr. Bradley Hickey. "This clinical trial is based on studies that were conducted in the 1970s to 1990s which demonstrated greater than 90 percent protection lasting for at least 10 months in human volunteers who were immunized by bites from mosquitoes carrying sporozoites weakened by radiation. The IMRAS study was specifically designed to achieve approximately 50 percent sterile protection in order to facilitate the identification of biomarkers and correlates of protection."

The primary objective of the Navy Malaria Program is to develop a vaccine that kills the parasite during its first few days of development in the liver, before it breaks out into the blood. If this approach is successful, it will prevent the clinical manifestation of malaria, which occurs only in conjunction with blood stage infection and not with the liver stage.

In the past 40 years, the Navy Malaria Program, in collaboration with the Walter Reed Army Institute of Research and other partners, has made significant contributions toward developing an efficacious vaccine for the military.

Among their achievements include

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the development and testing of an attenuated whole sporozoite vaccine that demonstrated high-level protection against a controlled human malaria infection and gene-based DNA, and viral vector vaccines, which have induced partial protection against malaria infection. Research investigators have developed humanized mouse models for the preclinical testing of vaccine candidates and are actively engaged in the search for

novel malaria antigens through a robust antigen discovery program.

As it currently stands, *Plasmodium falciparum* is one of the five species of malaria parasites that infects humans.

Hickey added that "from a clinical perspective it [*Plasmodium falciparum*] causes the most severe form of malaria,"

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Navy Researchers Battling Malaria with Partners in the Private Sector

Story by Paul A. Coulis, Ph.D., NMRC Office of Partnerships & Business Development

SILVER SPRING, Md. - Scientists at the Naval Medical Research Center (NMRC) have joined forces with several private-sector allies in efforts to develop a vaccine to prevent infection with *Plasmodium falciparum*, a parasite that causes malaria.

The Bill and Melinda Gates Foundation has provided substantial support for this effort through direct funding to NMRC with Cooperative Research and Development Agreements (CRADAs) or through grants to NMRC's research partners, which include pharmaceutical and biotechnology companies and universities. Much of this support comes from the Program for Applied Technologies in Health (PATH), a non-profit organized and funded by the foundation.

Research partners exchange expertise, antibodies, genes, cell lines, *Plasmodium* proteins and more under the terms of CRADAs developed and administered by NMRC's Office of Partnerships & Business Development. The staff of NMRC's Malaria Vaccine Program, headed by Dr. Eileen Villasante, includes some 35 scientists and technicians.

NMRC's ongoing efforts in this area include studies to:

- Develop and evaluate vaccine delivery systems based on weakened human viruses serving as carriers for genes that direct the production of malaria proteins of interest. Such vaccines could induce cell-mediated immune responses that would kill the parasite in the liver of the host.
- Identify epitopes (target sites in protein molecules) on the surface of the malaria parasite vulnerable to effective attack by the immune system of the host.
- Develop laboratory tests for the high-throughput identification of novel antibodies specific for proteins critical for the replication of the malaria parasite.
- Develop safe and effective whole-parasite vaccines.

Navy Medicine researchers continue to explore many promising avenues toward finding a safe and effective malaria vaccine for the warfighter. Perhaps the most promising aspect of NMRC's malaria vaccine research to date is a collaboration with Sanaria Incorporated, a Rockville, Maryland-based biopharmaceutical company. Sanaria developed a vaccine consisting of live *Plasmodium* organisms weakened by irradiation and as a result, have lost the ability to cause disease.

In early, small-scale clinical trials of the vaccine in human volunteers, 100 percent protection was observed in a group of six subjects who received six injections of the highest dosage of the vaccine. In a similar group of nine subjects who received four injections of the highest dosage of the vaccine, six were protected. Larger clinical trials involving human subjects began last year. Only time will tell if this approach will turn out to be the most successful.

More troops have died or been incapacitated by malaria in endemic areas than by hostile fire in the twentieth century, according to the Department of Defense. The incidence of the parasite's resistance to anti-malarial drugs administered to warfighters and others is rapidly growing, making the development of an effective vaccine against malaria an increasingly urgent priority for global health.

Persons at risk include warfighters as well as travelers and 3.4 billion people living in areas endemic for malaria. These include much of Asia, sub-Saharan Africa, Central and South America, and countries in the Mediterranean and the Middle East. An estimated 250 million cases, resulting in more than one million deaths, were reported last year.

NMRC Researchers Conduct Phase 1 Malaria Clinical Trials

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and "in the military population malaria infection can severely degrade human performance, resulting in missed duty, prolonged hospitalizations and possibly death."

The IMRAS study is designed to accelerate vaccine development by using cutting-edge immunological tools. These tools are available to further understand how immunizations with irradiated sporozoites result in protection against controlled human malaria infection.

"Study subjects receive five immunizations via mosquito bites over the course of the study," said Hickey. "Each of those immunizations is spaced approximately four weeks apart and following the final immunization, subjects undergo a controlled human malaria infection. This determines whether or not they were protected against malaria. Having served as an Operational Medicine Physician, malaria was a constant concern for me as I did my best to take care of deploying Sailors and Marines. Malaria can quickly make an entire unit mission ineffective

and I have seen firsthand how important a malaria vaccine would be for our warfighters ... I am proud to be part of this effort."

The Infectious Diseases Directorate is openly recruiting for IMRAS Cohort II. They are looking for healthy malaria-naïve adult volunteers between the ages of 18 and 50. For inquiries the NMRC Clinical Trials Center can be reached at 301-295-4295 or malariactc.nmrc@med.navy.mil.

Hearing Conservation - Predicting Hearing Loss before Damage Occurs

Story courtesy of NSMRL Public Affairs

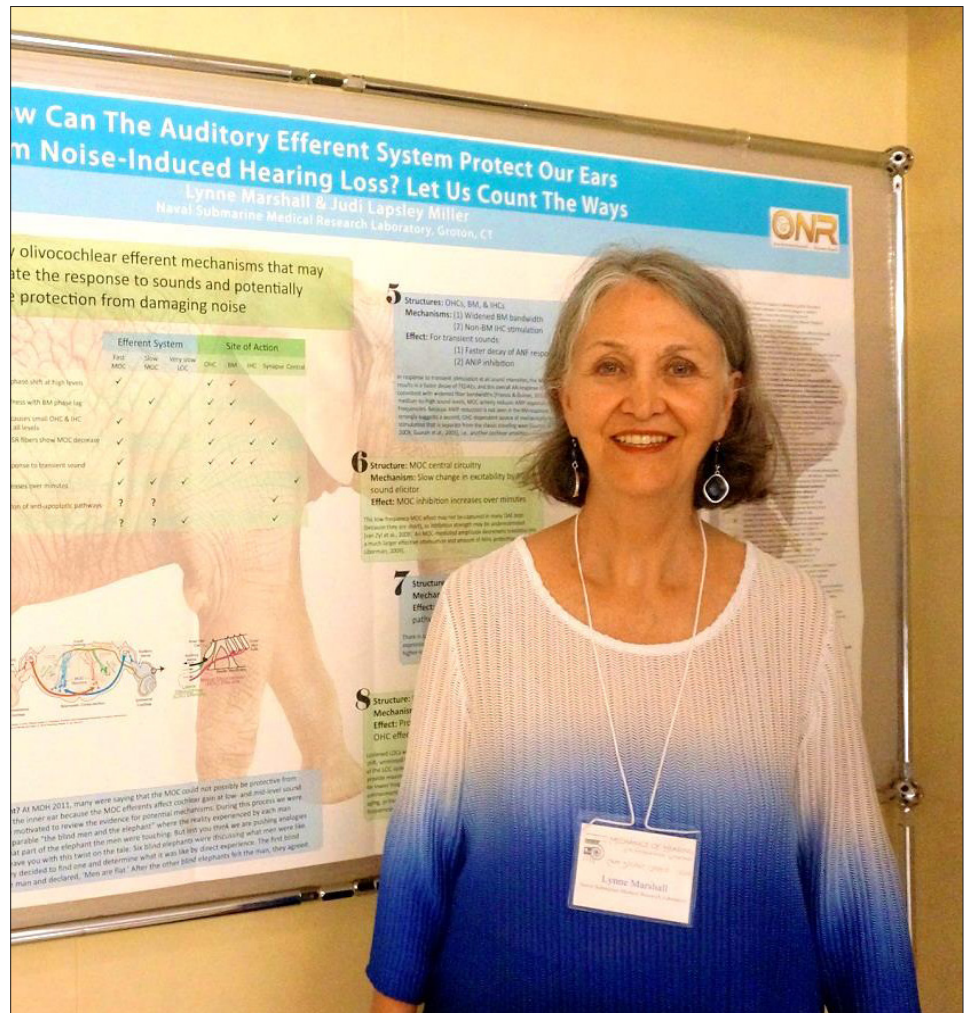
GROTON, Conn. - The holy grail of hearing conservation is a test to find out who is most susceptible to noise-induced hearing loss before any damage occurs. Researchers at the Naval Submarine Medical Research Laboratory (NSMRL) are one step closer to achieving this goal after devising a clinically-viable test for a brain reflex, shown by other researchers to predict hearing loss susceptibility in laboratory models.

The Medial-Olivocochlear Reflex indicates how well the hearing system copes with loud noise. A reflex with high strength sends signals from the brain to the inner ear, telling it to turn the volume down, whereas a weak reflex does not.

According to the principal investigator, Dr. Lynne Marshall, "We want to find those people with weak reflexes who are scheduled to work in noisy environments to give them extra support like custom-fit hearing protection or more regular hearing tests."

The test is non-invasive and there is no need for people to respond whether they have heard a tone or not. Instead sounds are played into each ear and tiny echoes from the inner ear are measured using a sensitive microphone placed in the ear canal.

"To develop a good clinical test, we took cumbersome laboratory methods and worked out what was important and what was superfluous, while maintaining high validity and reliability. For instance, we'd hoped that both ears of a person would show equal strength, but they don't. So we now know we have to test both ears. But we have also isolated the frequency



Dr. Lynne Marshall at the Mechanics of Hearing Meeting last summer. Her poster highlighted eight possible ways that the Medial Olivocochlear Reflex (MOCR) could protect against noise-induced hearing loss and cochlear neuropathy. Developing a fast and accurate test to measure MOCR strength is one of her research goals. (Photo courtesy of NSMRL Public Affairs)

regions that are most reliable, and this allows us to focus on them," said Marshall.

Other researchers have tried to establish if the reflex predicts susceptibility, without success. The NSMRL researchers believe their approach is better because unlike other efforts, they established that their test had the statistical clout needed for a clinical test.

Dr Marshall is currently incorporating the test into clinical audiological equipment, and working towards clinical trials on people who are exposed to noise in their workplace.

About a half-million Navy personnel are enrolled in Navy hearing conservation programs.

NAMRU-Dayton Scientists Participate in Pulmonary Health Research Review

Story courtesy of NAMRU-Dayton Public Affairs

DAYTON, Ohio - Dr. Michael L. Gargas, Naval Medical Research Unit - Dayton (NAMRU-D) Environmental Health Effects Director, and Capt. Rees L. Lee, NAMRU-D Executive Officer, were invited to participate in an eighteen person review panel for the Military Operational Medicine Research Program (MOMRP) Pulmonary In-Progress Review (IPR) at Fort Detrick, Maryland, December 4, 2014.

Under the direction of the Joint Program Committee 5 (JPC-5), the pulmonary health research program of the MOMRP is required to conduct an IPR once a year.

The stated purpose of the IPR is to ensure an integrated pulmonary health research program of scientific excellence leading to products that improve and sustain the health and performance of service members. The objectives of the IPR include reviewing

JPC-5 MOMRP research efforts and providing suggestions with regard to the scientific excellence of the projects and likely translation to a military application.

The meeting also provided the opportunity to foster collaboration between pulmonary research groups as well as addressing ongoing challenges and future directions for the pulmonary program.

The review panel consisted of representatives from academia, the private sector, the Defense Health Agency (DHA), as well as from the other military services.

The Pulmonary IPR reviewed four on-going research projects funded by the MOMRP/JPC-5 and one proposed project. Panel members rated each project using a computer based evaluation form.

They completed the forms during the presentations, the question and answer period, and for a specified time immediately following the discussions. This format allowed timely feedback to the MOMRP/JPC-5 on each project.

Participation in these events are vital not only to assure the relevance and quality of the research programs intended to aid service members, but also serves as a way to promote and encourage "jointness" within the Department of Defense research efforts. With shrinking availability of research funds, it is only prudent to avoid duplication of research efforts and maximize the return on investment.

The sharing of information, the exchange of ideas, and the networks established during IPRs go a long way toward reaching these goals.

Navy Surgeon General Fosters Medical Collaboration, Global Health in Egypt

(continued from page 4)

between our medical departments as we engage in operational settings," said Nathan.

Before touring the college, Sallah provided the surgeon general with a brief overview of the college, including the school's mission, vision, student selection and rationale of the course curriculum.

"The military medical officer must be competent in all military medical scenarios for serving in

different operational situations of the battlefield," said Sallah. "The military medical officer must be prepared physically, psychologically, and medically to accommodate the harsh military environment."

The visit concluded with a gift exchange between the surgeon general and the dean.

"General, it has been a true privilege for me to visit your medical college. I'd like to present this medallion to you on behalf of my office," said Nathan. "The

common language of medicine goes beyond borders. We're all interested in the same thing, and that is better health and welfare for those serving in our armies and navies."

While in Cairo, Nathan also met with U.S. Ambassador to Egypt R. Stephen Beecroft, and Dr. Adel Adawi, minister of health and population.

NAMRU-Dayton Stays at the Forefront of Advancing Military Fuels

Story courtesy of NAMRU-Dayton Public Affairs



A U.S. Navy seaman carries a fuel hose to refuel an AV-8B Harrier jet during flight operations aboard the amphibious assault ship USS Makin Island in the Pacific Ocean, Aug. 16, 2014. (U.S. Navy photo by Petty Officer 2nd Class Christopher Lindahl)

DAYTON, Ohio - Alternative fuels continue to push forward for use within the Department of Defense. Fuel chemists and engineers developed processes utilizing everyday sources, such as fats and vegetable oils or renewable resources including algae and biomass, converting them into various fuel forms that function similarly to conventional fuels. In addition to the obvious and necessary operational testing, the potential effects of fuel exposure on the warfighter also must be a consideration.

The Naval Medical Research Unit - Dayton (NAMRU-D) has been at the forefront of the DoD's alternative fuel efforts by helping to provide toxicological, health and risk assessments. NAMRU-D performs toxicology research to fill the data gaps with regard to potential health effects and risk associated with exposure to

these newly developed fuels.

As part of these efforts, Dr. Karen Mummy, NAMRU-D team member and Deputy Director of the Environmental Health Effects Directorate, provided two briefings at an annual gathering on toxicology perspectives on jet and alternative fuels.

The first of Mummy's briefings consisted of a summary of data from a recent toxicology study performed at NAMRU-D that evaluated the health effects of inhalation exposure to an alcohol-to-jet fuel.

A second briefing provided mechanistic insight into the proposed molecular pathways that lead to the toxicological effects of fuels and similar complex mixtures.

The work was done in collaboration with the Air Force 711th Human Performance Wing (HPW)/RHDJ and funded by the Alternative Fuels Certification Office.

The event took place at Tec^Edge Innovation and Collaboration Center in Dayton, Ohio, November 6, 2014. This gathering has been held annually since 2010 and serves to bring together leaders in fuel chemistry and toxicology from industry, DoD, and the Environmental Protection Agency (EPA).

This event offers great opportunities for chemists and toxicologists from the DoD and industry to consider new advances and identify data gaps that need to be filled to determine the risk of exposure to fuels.

NMRC-A and Duke-NUS Cooperate in Fight Against Dengue

Story by Lt. Cmdr. Ian Sutherland, PhD

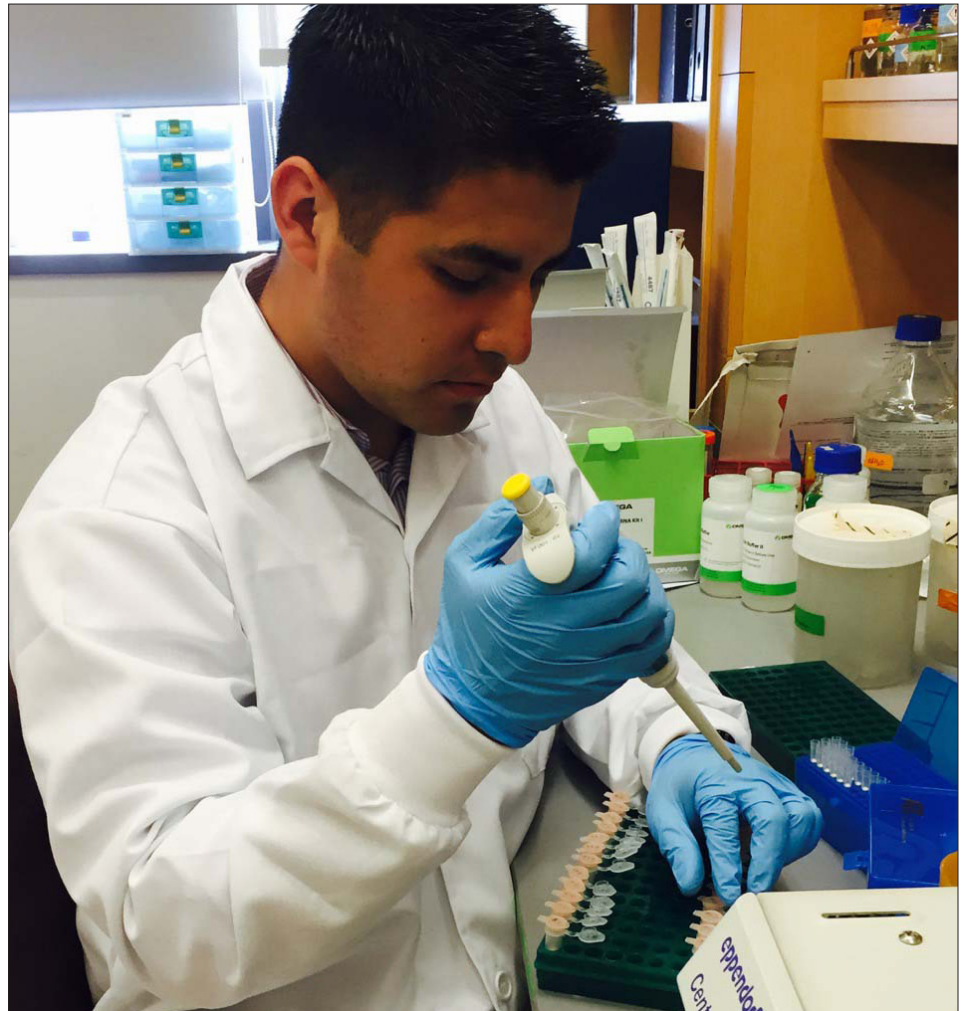
SINGAPORE - The U.S. Naval Medical Research Center-Asia (NMRC-A), in collaboration with the joint research institute of Duke University and the National University of Singapore Graduate Medical School (Duke-NUS), has been engaged in a research cross-training project in medical entomology, since November 2014. Hospital Corpsman from NMRC-A have the unique opportunity to work shoulder-to-shoulder with top-tier health scientists in the laboratories of Duke-NUS.

HM2 (FMF) Jason Ramirez, a Preventive Medicine Technician (PMT) from NMRC-A, was the first HM to participate in the cross-training project.

“Working with Duke-NUS has been great. PMTs just don’t get to do this type of work in the field. We often make recommendations and implement controls in deployment settings, but to actively be involved in this type of benchtop effort and exploring the ‘why’ aspect of what I and my fellow PMTs execute--it’s truly exciting,” said Ramirez.

This collaboration is coordinated by medical entomologist, Dr. Julien Pompon, senior research fellow of the Emerging Infectious Diseases (EID) program at Duke-NUS and Lt. Cmdr. Ian Sutherland, head of Entomology, NMRC-A. Pompon’s work is focused on vector competence of mosquitoes transmitting dengue viruses.

“This collaboration is fruitful for each partner. NMRC-A personnel are training in advanced dengue and vector-related techniques which can then be applied at sites around the world. I hope this successful partnership will continue to grow and that the acquired skills and



HM2 (FMF) Jason Ramirez of the U.S. Naval Medical Research Center - Asia conducts vector biology training in Singapore with Duke-NUS to help in the ongoing fight against dengue and other mosquito-borne diseases. He is shown here raising larval mosquitoes and subjecting them for molecular analysis and related testing procedures. (Photo courtesy of NAMRU-Asia Public Affairs)

collaborative spirit will blossom into additional joint projects between Duke-NUS and NMRC-A,” said Pompon.

NMRC-A’s lead PMT, HM1(FMF) Harold Sylvester, has supervised Ramirez during this period and ensured a smooth, cooperative atmosphere.

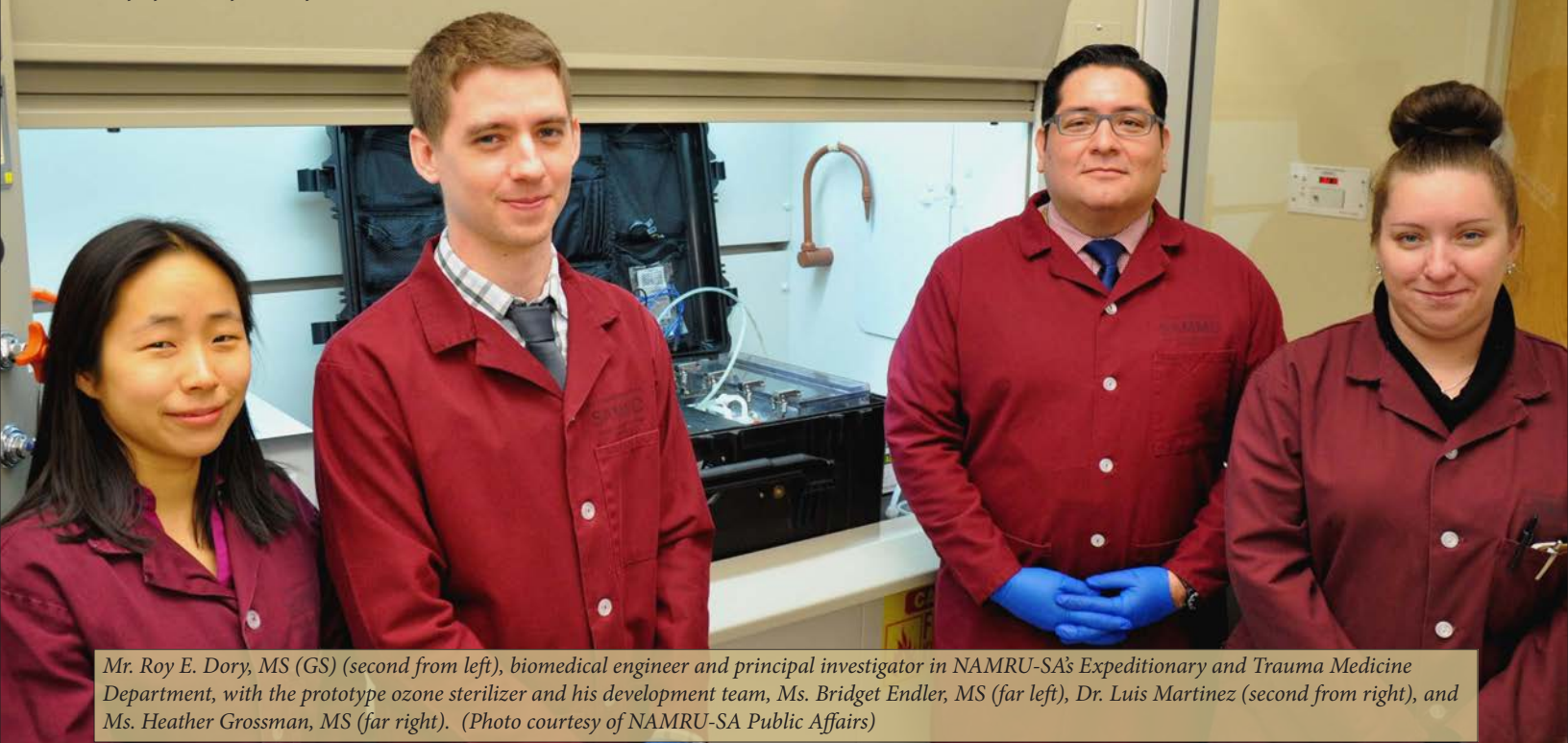
“The research conducted by our facilities directly impacts combating infectious disease not only for our Sailors and Marines, but for the

people throughout the Asia-Pacific (area). This embodies the Navy’s views on diversity and demonstrates how everyone benefits from teamwork and sharing,” said Sylvester.

This collaboration marks the first time these world-class infectious disease institutions have operated on this level together, and they hope to ultimately help reduce the frequency and burden of insect-borne pathogens across Singapore and the region.

NAMRU-San Antonio Investigators Develop Field-Portable Ozone Sterilizer

Story by Mr. Roy E. Dory, MS, NAMRU-San Antonio



Mr. Roy E. Dory, MS (GS) (second from left), biomedical engineer and principal investigator in NAMRU-SA's Expeditionary and Trauma Medicine Department, with the prototype ozone sterilizer and his development team, Ms. Bridget Endler, MS (far left), Dr. Luis Martinez (second from right), and Ms. Heather Grossman, MS (far right). (Photo courtesy of NAMRU-SA Public Affairs)

SAN ANTONIO - Combat operations and humanitarian missions often place military clinicians, dentists, and front-line corpsmen in austere conditions. Available sterilization systems intended for field use are often bulky and require consumable resources, including chemicals or large sources of energy, which must be transported to the point of use.

Recent testing by researchers in the Immunodiagnostic and Bioassay Department at Naval Medical Research Unit - San Antonio (NAMRU-SA) demonstrated gaseous ozone, a strong oxidizing agent, can be generated from oxygen in ambient air at sufficient concentrations to effectively destroy bacteria. The technique offers an alternative method of sterilization that requires no consumable chemicals and relatively small amounts of energy.

With funding from the Marine Corps Systems Command, NAMRU-SA researchers teamed up with engineers in the Expeditionary and Trauma Medicine Department at NAMRU-SA to develop the concept into a portable, prototype

sterilization system. The prototype ozone sterilizer has a sterilization compartment designed to accommodate small medical instruments and dental tools, and is housed in a ruggedized carrying case. The system can be powered from external sources or from an internal battery pack, which allows for approximately five complete sterilization cycles between charges. The system is fully automated, with custom developed software to control ozone production, monitor conditions in the sterilization compartment, and convert remaining ozone back into oxygen at the end of a sterilization cycle.

The prototype recently underwent a battery of tests at NAMRU-SA to determine the effectiveness of the system at destroying twenty-four different bacterial strains of importance to military medicine. The sterilizer effectively eliminated all of the plated bacterial strains, including both Gram-positive and Gram-negative bacteria, and antibiotic resistant strains such as *Methicillin-resistant Staphylococcus aureus* (MRSA).

Leveraging the recently collected data,

efforts are currently underway to further optimize the prototype ozone sterilizer. The engineering team aims to improve the efficiency of the system, thereby extending battery life, while also increasing ozone production, which will allow the effective sterilization time to be reduced. The team is also exploring methods to further reduce the size and weight of the sterilizer.

At the conclusion of the current design iteration, NAMRU-SA hopes to transition the prototype sterilizer to the Navy Advanced Medical Development Team to assist with further development and ultimately transition the technology to the fleet.

The ozone sterilizer development began as a set of bench-top experiments and has now emerged as a functional prototype, illustrating NAMRU-SA's translational approach to biomedical research. With further optimization, NAMRU-SA investigators hope to offer a truly portable and self-sufficient field sterilizer that can be deployed with medics and corpsmen enhancing the care available to the warfighter.

Navy Surgeon General, Force Master Chief Applaud Science, Collaboration at NAMRU-3

Story by Capt. Dora Lockwood, U.S. Navy Bureau of Medicine and Surgery Public Affairs

CAIRO -- (NNS) - The Navy's Surgeon General and Hospital Corps Force Master Chief (FORCM) completed a visit to U.S. Naval Medical Research Unit No. 3 (NAMRU-3), February, 17.

Vice Adm. Matthew L. Nathan, Navy surgeon general and chief, U.S. Navy Bureau of Medicine and Surgery, and FORCM Sherman Boss received an overview of current projects and ongoing infectious disease surveillance efforts in Egypt and Africa while visiting NAMRU-3 facilities.

During an all-hands call with Sailors, civilians and Egyptian scientists, Nathan applauded the research and scientific work being done by the employees at NAMRU-3.

"I am humbled by your work, your knowledge," said Nathan. "I want you to know how much I appreciate what you do here. I want you, the Egyptians, the military and the civilians, to understand that even though my office is very far away, I'm very much aware of what you do."

Nathan emphasized the importance of the work and the significant impact scientific research has on global health.

"There are so many diseases in the world. Some diseases are carried by birds, some by mosquitoes, some by the water, some in the soil and some are transmitted from person to person," said Nathan. "This region and more and more of the world are depending on you to identify, to understand and to help prevent these diseases. There are so many people around the world who do not know you, yet whose lives will be changed for the better because of you and what you do."



Navy Surgeon General and Chief, U.S. Navy Bureau of Medicine and Surgery Vice Adm. Matthew L. Nathan (sixth from left) and Force Master Chief Sherman Boss (fifth from left), completed a visit to U.S. Naval Medical Research Unit No. 3 (NAMRU-3), Feb., 17. Nathan and Boss received an overview of current projects and ongoing infectious disease surveillance efforts in Egypt and Africa while visiting NAMRU-3 facilities. (Photo taken by Capt. Dora Lockwood, Bureau of Medicine and Surgery Public Affairs)

Nathan concluded by expressing his appreciation for the long-standing collaboration between the U.S. Navy and the Egyptian scientists.

"You have kept the science and the goodness of NAMRU-3 in Egypt going for many, many years," said Nathan. "Thank you for being great partners and great examples of what different nations can do when they come together for the rest of the world. You make the world a better place."

NAMRU-3, established in 1946, is the oldest Department of Defense overseas military medical research facility and one of the largest research laboratories in the North Africa-Middle East region. NAMRU-3 conducts research and surveillance to support military personnel deployed to Africa, the

Middle East, and Southwest Asia.

NAMRU-3 works closely with the Egyptian Ministry of Health, the U.S. National Institutes of Health, the World Health Organization (WHO), the U.S. Agency for International Development, and the U.S. Centers for Disease Control and Prevention.

U.S. Navy Medicine is a global health care network of 63,000 Navy medical personnel around the world who provide high quality health care to more than one million eligible beneficiaries.

Navy Medicine personnel deploy with Sailors and Marines worldwide, providing critical mission support aboard ship, in the air, under the sea and on the battlefield.

Navy Medicine Research Team Studying Mild Traumatic Brain Injury

Story by Doris Ryan, Naval Medical Research Center Public Affairs



Dr. Usmah Kawoos (left) and Lt. Jacob Norris (right) review how the neurotrauma department applies telemetry in monitoring the physiological response to blast-induced traumatic brain injury. This system is used by Kawoos and Dr. Mikulas Chavko to increase basic understanding of how blast waves impact the body. Use of this sensor system for prospective data collection directly informs observational human studies like Norris' in the Neurotrauma Department. (Photo taken by Mikelle D. Smith, Naval Medical Research Center Public Affairs)

SILVER SPRING, Md. – A research team from the Neurotrauma Department at the Naval Medical Research Center (NMRC) is studying concussions sustained during combat resulting in a diagnosis of mild traumatic brain injury (mTBI).

They are evaluating clinical data from nearly 1,200 warfighters from the Concussion Restoration Care Center, a Navy-Marine Corps initiative that provided care in Afghanistan to injured service members.

“Our department’s research is focused on understanding traumatic brain injury from the basic physiology all the way to what impact TBI may have on quality of life or the family environment. As part of this effort, I am characterizing mTBI concussion by starting with the patient data-sets from the center and looking at blast injuries, mainly from improvised explosive devices,” said Lt. Jacob Norris, Research Psychologist, who is leading the study. “I hope to be able to provide insight to clinicians as to what are the red flags

that occur in the hours to days following injury that may indicate whether or not a service member may later develop persistent mTBI.”

He went on to explain that blast causes measurable changes to the brain’s physiology which may alter how the brain inhibits fear and anxiety. For example, when a warfighter is on patrol and sees something that suggests an imminent IED event, the blast goes off, and there is a stress and anxiety response, and a concussion. The next time the warfighter goes out on patrol and sees the same thing there is an appropriate stress and anxiety response, then training kicks in and appropriate action is taken. But, when the warfighter returns home and sees something that reminds him of the IED blast he may feel persistent fear and anxiety that is no longer needed. The evidence suggests that the brain’s ability to adjust to new scenarios is impaired as a result of blast.

Norris’ interest in this field of research

began during his deployments to Afghanistan as part of the Joint Combat Casualty Research Team.

“There I was able to see the profound impact that good medical research can have on patient care. During the time I spent there, I was able to see how clinicians tasked with mTBI care wanted to know more about how they could improve what they were doing. These experiences really left an impression on me,” he said.

Norris is evaluating specific health information and treatment records from a variety of test results used by providers at the center to diagnose mTBI. These tests include post-concussive symptom checklist, the Automated Neuropsychological Assessment Metric (ANAM), screening for Acute Stress Reaction and Post-traumatic Stress, as well as balance tests like the Balance Error Scoring System or the Sensory Organization Test.

“These are people who received an intense evaluation and diagnosis of mTBI in a day to a week following a concussion. So I am seeing what the injury looked like closer to the time of injury opposed to months or years later,” said Norris. “This will help us understand what the injury looks like early on, so this is an important patient population to study. Furthermore, understanding this patient population informs our laboratory and experiment-based efforts.”

Norris hopes to expand his research to include looking at neuroendocrine dysfunction and cardiovascular health problems preceding the injury that may have an impact on the outcome of the injury, or if these conditions develop after the injury.

“This work has the potential to help improve assessment, treatment, care, and rehabilitation following mTBI for DoD personnel,” said Norris. “Research into neurotrauma is vitally important for the long-term improvement of health care for the active duty population.”

R&D Chronicles

Navy Medicine's Scientific Foundation

The Age of the Naval Medical Research Units (NAMRUs) Part VI

By Andre B. Sobosinski, Historian, Bureau of Medicine and Surgery

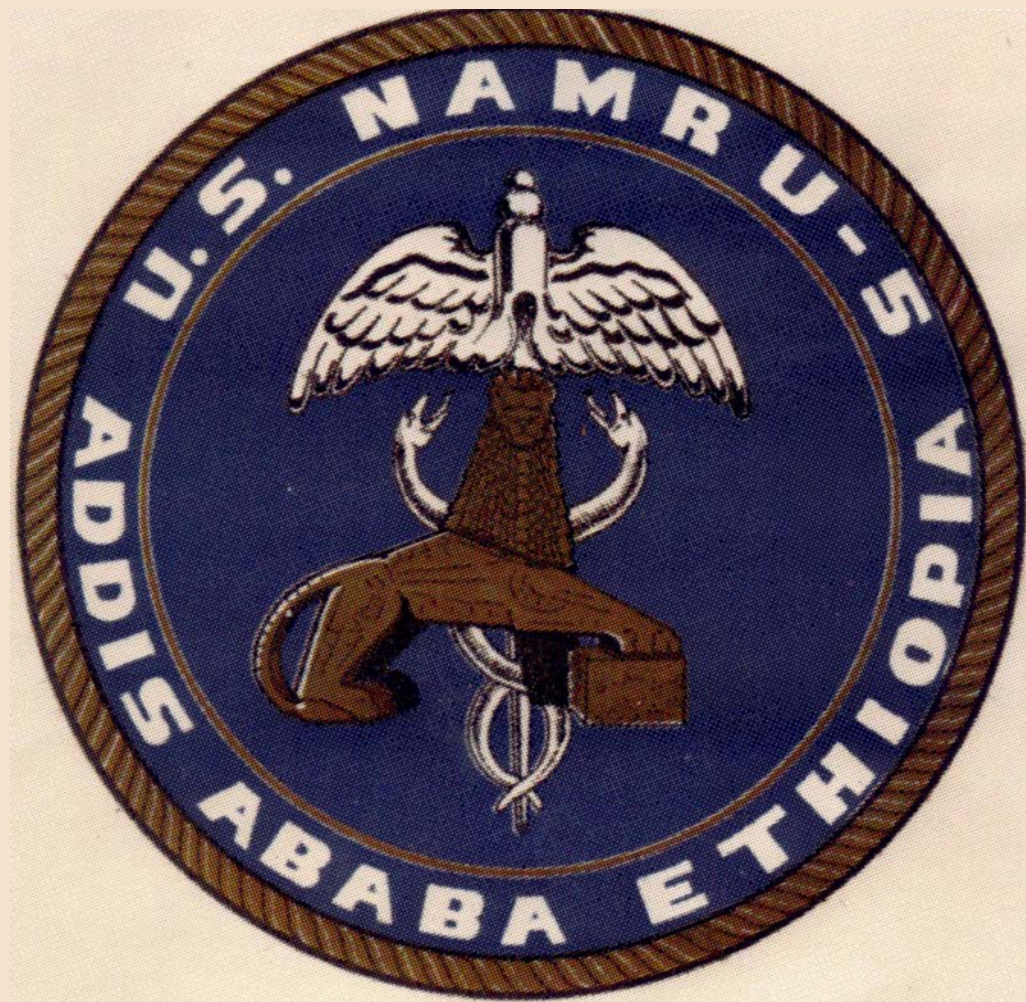
"...we now have, at the invitation of the Egyptian government, and with the blessing of the State Department, a well-organized naval research unit permanently located at Cairo, Egypt. There, at the crossroads of world travel, it is engaged in medical research and investigation...on diseases and medical problems which, though rare in the United States, are of importance to the Military Forces and the large regions of the world."

~Rear Adm. Claude Swanson, Surgeon General of the Navy (1946-1951)

Even though NAMRUs have become synonymous with disease control and surveillance efforts in North Africa, the Middle East, Asia and South America, the program actually began stateside at the University of California at Berkeley.

NAMRU-1 was first established as the Navy Medical Laboratory Unit No. 1 in 1934 (redesignated as NAMRU-1 in January 1944). Its mission, which would be the model and foundation for future Naval medical research units, was to conduct biomedical research, gather information on military medical problems, study communicable diseases and conduct training in research techniques. The prime focus was airborne infectious diseases. NAMRU-1 also made progress in the development of field laboratory equipment, devising protective clothing for use in studying contaminated environments and allowing for the safe study of virulent organisms. The unit also pioneered experiments in chemotherapy, detection of tubercle bacilli and studying physiological stressors in cold weather operations. NAMRU-1 was disestablished in 1974.

Established by the Rockefeller Institute in New York City in 1944, the NAMRU-2 was deployed to Guam in 1945 where its scientists studied tropical diseases affecting U.S.



service personnel in theater. It was redesignated the U.S. Naval Institute of Tropical Medicine (NITM) in 1946 and deactivated in 1947. Reestablished in Taipei, Taiwan, in September 1955, and commissioned November 7, 1957, NAMRU-2, over the next two decades, was led by the legendary scientist

Capt. Robert Phillips, MC, USN. With Phillips at the helm, NAMRU-2 would help pioneer the treatment of cholera and send teams of medical personnel to treat victims of cholera epidemics in Bangkok, Saigon, Manila, and India.

(continued on page 17)

Who Won the NAMRU-Dayton Popeye Award?

Story courtesy of NAMRU-Dayton Public Affairs

DAYTON, Ohio - At the Naval Medical Research Unit – Dayton (NAMRU-D), Lt. Cmdr(s) Michael Tapia really jumped into things with both feet. In his spare time, he lives up to his call sign, “Freak” by putting on a freakish display of physical aptitude, notching a perfect score on the fall 2014 PFT. He was awarded the first ever NAMRU-D “Popeye” award! His week in and week out fitness routine is a positive influence on the command.

He is a blur of successful movement, a true embodiment of the command motto “Climb, Roll, and Boom!” He has become a key contributor to an ongoing fatigue protocol by quickly qualifying to serve as a physiological monitor. This is a key position that provides oversight and ensures subject safety during the execution of the protocol. Additionally, he conducted an evaluation of the Zephyr Bio-harness accelerometer unit for possible use in future studies. He also became the lead for the acquisition of a Normobaric room at NAMRU-D to conduct hypoxia studies in a scientifically controlled environment at current altitude.

Undoubtedly, his niche has been established by becoming the resident aerospace physiologist in three Vision Science Laboratory studies; two addressing laser point threats to aviation and one involving aviation color vision standards. Tapia assumed a lead role for the lab to work with the fleet to assess MH-65 and MH-60 aviator acceptance of low intensity threat laser eye protection (LEP) spectacles for night missions.

The Army, Navy, Air Force and Coast Guard have reported an increase in cockpit laser pointer illumination events during critical phases of flight. Tapia is working with NAMRU-D's Vision Science Lab senior investigator and colleagues from the 711th Human Performance Wing, Air Force Research Laboratory, Materials and Manufacturing Directorate, Photonic Materials Branch to collect aviator assessments of laser eye protection compatibility with rotary-wing simulator cockpit displays. Positive results will drive



NAMRU-Dayton Commanding Officer Capt. Jeffrey Andrews congratulates Lt. Cmdr (s) Tapia as the first ever Popeye Award recipient. This award recognizes the officer with the best performance on the Physical Fitness Test. He earned the maximum possible score of 300. (Photo courtesy of NAMRU-Dayton Public Affairs)

research and acquisition of low-cost LEP to mitigate laser-pointer veiling glare in aviation environments.

He is also a co-investigator for a color-vision research project designed to usher in a new era of computer-based color vision tests with selection criteria tied to color-symbol discrimination performance in specific operationally relevant environments.

Finally, Tapia is a co-investigator for a Coalition Warfare Program non-lethal laser threat research project. He is spearheading the Laser Safety Review Board's (LSRB) assessment of both a terrestrial and marine laser range for

use in human exposures to laser glare across eight different visible-light laser wavelengths. This research is predicated on LSRB approval. Research outcomes will drive the refinement of models that predict how laser light is scattered on the retina in military operational environments and contribute to United States and United Kingdom laser safety standards for outdoor laser use.

A consummate team player, he served as a test subject on two different research protocols and supported collateral duties necessary to maintain an efficient and successful command.

Navy Medicine's Scientific Foundation

The Age of the Naval Medical Research Units (NAMRUs) Part VI

(continued from page 15)

Over the years NAMRU-2 would establish detachments in Manila, Danang (at the Naval Station Activity) and more recently Singapore. Owing to ever-shifting geo-political situations, NAMRU-2 relocated from Taipei to Manila in 1979 and later to Jakarta, Indonesia in 1991. Today NAMRU-2 is presently located at National Institutes of Public Health, Phnom Penh, Cambodia, where it continues to chart a course against global emerging infectious disease threats.

Established at the Naval Hospital Dublin, Georgia, in 1944, NAMRU-4 began as an experimental research and treatment unit for rheumatic fever and streptococcal diseases. From the nineteenth century through World War II, acute rheumatic fever was one of the leading causes of "days lost to sickness or noncombat injury" in the Navy and Marine Corps. When the Naval Hospital closed in 1947,

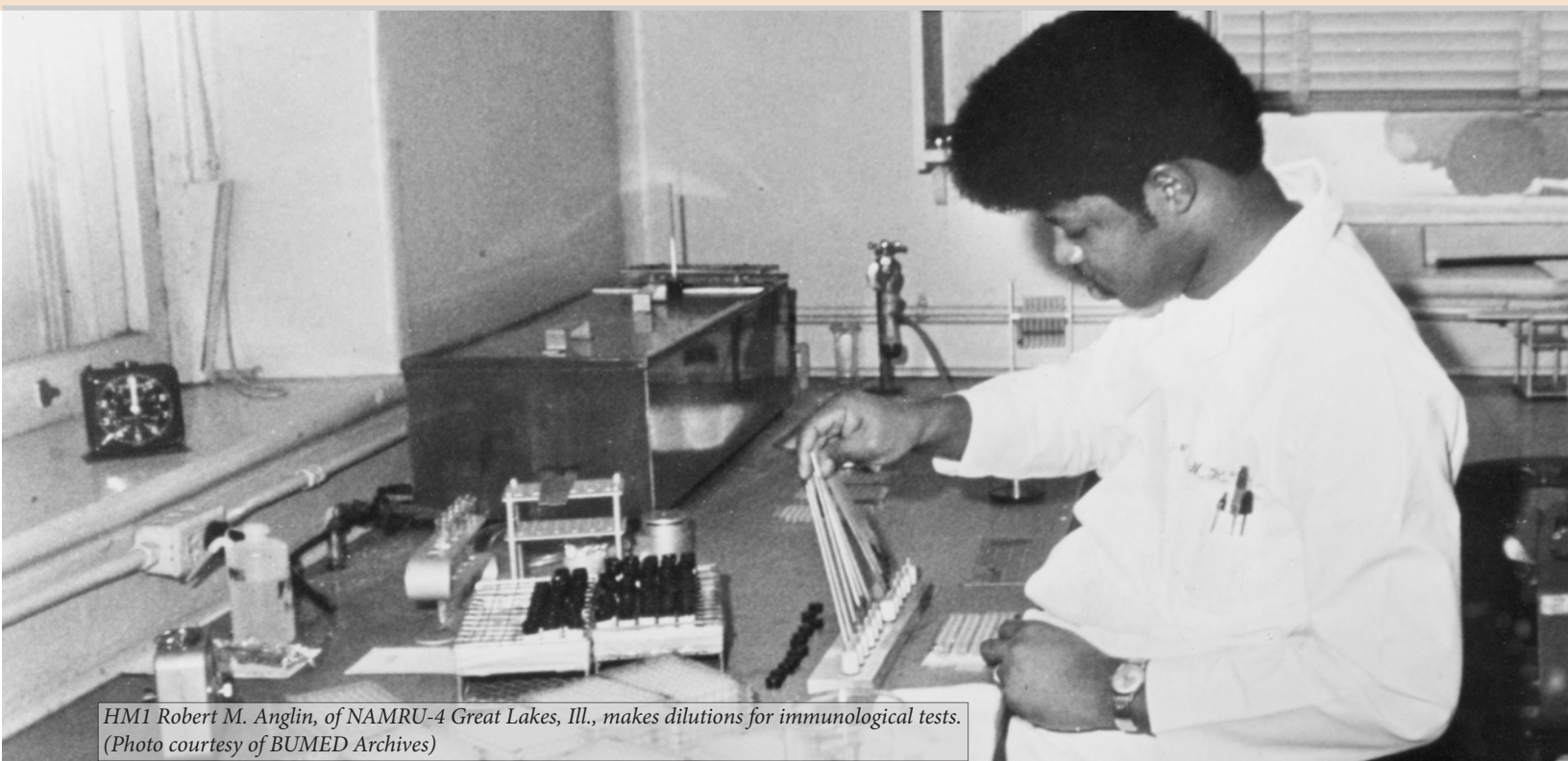
NAMRU-4 relocated to the Naval Training Center, Great Lakes, Illinois, where it set forth on an ambitious course of investigating problems affecting Navy recruits—i.e., influenza, pneumonia, respiratory infections, the common cold, and Meningococcal Infections. The Research Unit was disestablished in 1974.

Over the last 70 years, the Naval Medical Research Unit No. 3 (NAMRU-3) has been the beacon of biomedical research and bio-surveillance overseas. As the longest running and largest OCONUS military medical research unit, NAMRU-3 has symbolized the very tenets of medical diplomacy and innovation that has marked the history of the NAMRUs program.

Originally founded as a detachment of NAMRU-3 in Addis Ababa, Ethiopia, in 1965, NAMRU-5 was commissioned as a separate command

in 1974. It remained in operation until political unrest in the nation forced its closure in April 1977. In its short history, NAMRU-5 scientists investigated insect-borne vectors of disease, insecticide resistance, and set out to control lice populations and louse-borne diseases. Members of the NAMRU-5 staff were also among the last Americans to ever see smallpox before its eradication.

Located in Lima, Peru, NAMRU-6 began as a detachment of the Naval Medical Research Institute (NMRI) in January 1983. With an understanding of the Peruvian government, the detachment focused on infectious diseases of "mutual interest" to the host nation and the U.S. Navy. Later an independent field detachment of NMRI's successor, the Naval Medical Research Center (NMRC), it was commissioned as NAMRU-6 in February 2011.



HM1 Robert M. Anglin, of NAMRU-4 Great Lakes, Ill., makes dilutions for immunological tests. (Photo courtesy of BUMED Archives)

Lab in Egypt Supports Acute Viral Hepatitis Workshop

Story courtesy of NAMRU-3 Public Affairs

CAIRO – U.S. Naval Medical Research Unit No. 3. (NAMRU-3) staff partnered with the Egyptian Ministry of Health and Population (MOHP) to present a workshop on Acute Viral Hepatitis (AVH) Sentinel Surveillance at the Ministry's National Training Center, October 19 – 20, 2014. This collaborative surveillance project receives funding from the U.S. Centers for Disease Control and Prevention.

"Egypt has the highest prevalence of hepatitis C virus (HCV) in the world, with 14.7 percent of its population between 15-59 years of age chronically infected," said Dr. Salma Afifi, an epidemiologist from NAMRU-3's Global Disease and Detection Program, who serves on the surveillance project. "The 2008 Demographic and Health Survey indicated that the chronic infection rate increased with age and was more than 25 percent for 50-60 year-olds. Among 15-19 year-olds, four percent were chronically infected, demonstrating on-going HCV transmission."

Over 35 participants from five MOHP infectious disease hospitals attended the workshop. Each hospital sent a seven-person team of epidemiologists, laboratorians and information technology specialists. The surveillance teams discussed updates in methodology, monitoring and evaluation, and future plans. In addition, results of their data analysis and performance since beginning surveillance were presented.

The goals of the two-day workshop were to provide refresher training on both the epidemiology and laboratory components of the project, finalize a monthly report, solve technical and logistical problems, receive feedback and provide team motivation.

"We wanted the teams to know what a good job they were doing and convey that this was their project," said Dr. AbdelFadeel, a central team member and NAMRU-3's laboratory focal point on the project.



Dr. Mustafa AbdelFadeel explained the laboratory outcome of the project to the workshop participants, concentrating on problems and practices that should be avoided in the upcoming phase of the project. (Photo courtesy of NAMRU-3 Public Affairs)

The relationship between epidemiologists, laboratory staff, information specialists and hospital administration is crucial to the success of the surveillance. Communication obstacles were shared by the hospital teams. Dr. Ola Khater, a hospital director, and Dr. Samia El-Adawy, a surveillance coordinator, explained they felt motivated that their data could help improve the lives of those suffering from Hepatitis C in Egypt.

An estimated 150,000 new HCV infections occur each year in Egypt and HCV morbidity and mortality are predicted to double in the coming 20 years," said Afifi. She added that surveillance of viral hepatitis is essential to measure the burden and identify the disease trend in Egypt.

From 1995 to 2007, the MOHP, in collaboration with NAMRU-3, conducted hepatitis surveillance. The Ministry of Health developed a new, four-year action plan with strategies for prevention, treatment and control measures. The Ministry of Health asserts this action

plan will significantly decrease the death rate from viral hepatitis infection and significantly lower the number of new infections.

Future plans include training on data analysis and interpretation so that peripheral teams can see the benefits of participating in the surveillance.

"Egypt is fighting a war against hepatitis and this is an important step in the fight," said AbdelFadeel.

The Egyptian Ministry of Health is currently conducting a new assessment. While current prevalence rates have not been announced, Afifi noted the results of this current sentinel surveillance provide a reason for optimism. "In earlier surveillance we had noticed higher numbers of Hepatitis B and C identified in nine sentinel sites. More recent rates obtained from surveillance activities indicate that numbers seem to be decreasing."

Congratulations to Brenae McLeish, NRCS Youth of the Year 2015

Story courtesy of NAMRU-2 Public Affairs

SINGAPORE - Brenae McLeish, daughter of Bernard McLeish who works at the U.S. Naval Medical Research Unit No. 2, was selected as the Navy Region Command Singapore Youth of the Year 2015 and was recognized at an award ceremony, February 26. A panel of community leaders judged the interviews, speeches and application portfolios of the candidates. This was the inaugural Youth of the Year event at NRCS, sponsored through the Boys and Girls Clubs of America (BGCA).

"Both Alisa [McLeish's mother] and I are very proud of Brenae's accomplishments," said McLeish's father Bernard. "Not just in school, but also in her abilities to take on new challenges and excel at whatever she attempts. We continue to encourage and support her to give her best at whatever she decides to do."

Established in 1947, Youth of the Year is BGCA's premier recognition program for Club members, promoting service to the club, community and family; academic success; strong moral character; life goals; and poise and public speaking ability. The program is part of the Child Youth Programs and supports fostering young people's character, personal growth and leadership qualities.

Every Navy Child and Youth Program selects a Youth of the Year, who then goes on to participate at further levels of competition. Local winners each receive a \$1,000 scholarship and participate in regional competitions. Five regional winners

each receive a \$10,000 scholarship and compete on the national level. The National Military Youth of the Year receives at \$20,000 scholarship. The National Youth of the Year receives a \$25,000 scholarship and is installed by the President of the United States. Brenae will be travelling to Japan in mid-April to compete with six other awardees.



From left to right - Alisa McLeish (mother), Capt. Scott Murdock (Commander, Navy Region Command Singapore), Brenae McLeish (awardee), Bernard McLeish (father and NAMRU-2 employee) and Ed Brown (Boys and Girls Club Director, Military Services Asia). Ceremony took place at the Teen Center the Navy Child and Youth Program facility in Sembawang. (Photo courtesy of NAMRU-SA Public Affairs)

NAVAL MEDICAL RESEARCH CENTER WOULD LIKE TO WISH THE NAVY MEDICAL CORPS
HAPPY 144TH BIRTHDAY!
THANK YOU TO ALL MEDICAL CORPS OFFICERS FOR YOUR SERVICE.



Graphic illustration by Mikelle D. Smith, Naval Medical Research Center Public Affairs